

REMARKS

In the Office Action, the Examiner indicated that claims 1 through 23 are pending in the application and the Examiner rejected all claims.

Claim Rejections, 35 U.S.C. §102

In item 3 on pages 2 to 5 of the Office Action, the Examiner rejected claims 1 to 23 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,282,701 to Wygodny et al. ("Wygodny").

The Present Invention

The present invention provides a method for remote tracing, from a local data processing node, of the execution of a process within an application program running on a remote data processing node in a distributed data processing network. The application program includes its own local trace facility. Asynchronous messaging is used to send a trace command from a trace process, running on the local processing node, to a data exchange of the remote node. Thus, a real-time trace request can be sent at any time.

Each node includes process-private interrupt handling means for indicating the presence of a command for the process in the data exchange means. In response to receiving trace information, the a process-private interrupt of the trace process occurs. Further, in response to the process-private interrupt, trace information is read by the trace process from the local data exchange means.

U.S. Patent No. 6,282,701 to Wygodny et al.

U.S. Patent No. 6,282,701 to Wygodny et al. (“Wygodny”) discloses a software system which facilitates the process of tracing the execution pass of a client program. The tracing is performed based on trace instructions embedded directly in the client program, and they are executed each time the processor reaches this part of the code.

The Examiner Incorrectly Failed to Give Patentable Weight to Preamble Language

On pages 5 and 6 of the Office Action, the Examiner indicated that recitation of the application program having “its own local trace facility” in the preamble should not be given patentable weight because it appears in the preamble. The Examiner further asserts that the preamble is generally not accorded any patentable weight “where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone.”

While applicant does not disagree with the Examiner’s assertion of the law, applicant asserts that the body of the claim does depend on the preamble for completeness. More specifically, claim 1 includes in its body a direct reference to the claimed trace facility (original claim 1: “... said target process writing trace information from said **trace facility** ...”). To remove any doubt regarding the antecedent basis for the trace facility of claim 1, applicant has amended claim 1 to specifically recite in the body of the claim the “**local trace**

facility” as set forth in the preamble. Accordingly, the term “local trace facility” should be given patentable weight upon reconsideration.

The Cited Prior Art Does Not Anticipate the Claimed Invention

The MPEP and case law provide the following definition of anticipation for the purposes of 35 U.S.C. §102:

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP §2131 citing *Verdegaal Bros. v. Union Oil Company of California*, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987)

The Examiner Has Not Established a *prima facie* Case of Anticipation

There are fundamental differences between the operation of Wygodny and the claimed invention. The primary source of the difference revolves around the use of the term “interrupt” in Wygodny versus the use of the term in the present invention. The standard definition of an “interrupt” in software/programming parlance is an instruction that temporarily alters the flow of a computer program, and, more specifically, “a suspension of an execution of a computer program, caused by an event external to that program, and performed in such a way that the execution can be resumed.” *Dictionary of Computer Science Engineering and Technology*, by Philip A. Laplante, CRC Press LLC (2001). Applicant is consistent in its use of this term to describe the external interruption of the program via the claimed asynchronous interrupts.

Although Wygodny uses the term “interrupt” to describe the operation of its trace points, what Wygodny is really describing is a “exception”. In software/programming parlance, an exception is defined as “an event that causes suspension of normal program execution.” *Dictionary of Computer Science Engineering and Technology*, by Philip A. Laplante, CRC Press LLC (2001). As noted by the Examiner, this “interrupt” involves the insertion of selected object code instructions that create trace points. In other words, in Wygodny, the running program includes instructions that cause it to do something different (operate the trace points) if the execution of the program happens to pass through one of these instructions. A TCI file copied to the target machine accomplishes this.

The present invention includes process-private interrupt handling means at each node for indicating the presence of a command for a respective process. According to the present invention, an interrupt is sent to trigger a service routine in the target process at the time of the user’s choosing, not when the target process happens to encounter an INT instruction in the code. This selectively triggerable interrupt delivers an instruction to the target process in real time. Wygodny has no process-private interrupt handler as described and claimed in the present application. In Wygodny, the program is “adulterated” with “INT” instructions that cause data to be written to a trace buffer each time the instructions are encountered.

The difference can be illustrated by the following analogy. If a person is reading a book and encounters an unfamiliar word, to understand the context of the sentence in which the word appears, the user will have to stop reading and look up the word’s definition. Each time a reader comes to that word on that page, they will be “interrupted” and have to obtain

the word's definition. The encountering of this unknown word is equivalent to the processing of the portion of the program of Wygodny that creates the trace points. Each time a processor encounters those instructions, an exception will occur which causes the trace point to be created.

If the same reader is reading a different page, and the telephone rings, the reader can stop reading, take the call and have a telephone conversation with the caller, and then return to the book upon completion of the call. This interruption was essentially "inserted" by the caller, that is, the call would have occurred no matter what, regardless of where the reader was in the book, and rereading the same page over and over will not result in the telephone ringing each time that page is read.

This ability to selectively cause, at any time, a service interruption is accomplished using, among other things, asynchronous messaging to send a trace command from a trace process running on the local data processing node into a data exchanger of the remote data processing node. This element is expressly claimed in both independent claims (e.g., claim 1, "...sending, via asynchronous messaging, a trace command from a trace process running on said local data processing node into a data exchange means of said remote data processing node..."). By sending this trace command when desired, the process-private interrupt of the target process running on the remote data processing node is caused and then the target process writes trace information from the local trace facility to the data exchange. This trace information is transmitted across the network to the local data processing node, causing a

process-private interrupt of the trace process and the reading of the trace information by the trace process from the local data exchange means.

None of these elements are taught or suggested by Wygodny. Each of these elements are expressly claimed in the independent claims.

The remaining claims depend from these independent claims and are thus allowable for the same reason. Further, certain aspects of the Examiner's assertions respecting the independent claims are incorrect. More specifically, in paragraph 8, on page 4 of the Office Action, the Examiner asserts that Figures 1A and 1B teach that the remote data exchange means and the local data exchange means of Wygodny are mailboxes. An examination of Figures 1A and 1B of Wygodny reveal no mailboxes whatsoever. The same argument holds true respecting paragraph 9 on page 4 of the Office Action; that is, the text cited by the Examiner, column 6, lines 1-54 of Wygodny, make no mention of mailboxes at all.

For the above reasons, all of the claims are in allowable condition. The Examiner is respectfully requested to reconsider and withdraw the rejection of the claims. An early Notice of Allowance is earnestly solicited.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 09-0461.

Respectfully submitted

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Date

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